



X-Plain™

Knee Replacement-Physical Therapy

Reference Summary

Knee replacement surgery is a very successful and safe operation. Long-term success mostly depends on the patient, though.

The muscles around the knee joint must be strengthened after surgery and the patient needs to recognize the limitations of a new knee.

This reference summary reviews necessary steps that must be taken in order to get the most out of a new knee.

Anatomy

The knee joint connects the femur, or thighbone, to the tibia, or the shinbone.

The knee moves in one plane only: up and down, not side to side. Ligaments protect the knee from going sideways and getting injured. Even though the joint allows movement, it is the muscles of the legs that perform the actual motion.

The 2 main muscle groups involved in the motion of the knee joint are the “quadriceps” muscles (also called “quads”) and the “hamstrings” muscles.

Most of the quads are located in the front of the thigh; they anchor at the front of the shinbone, or tibia. These muscles allow the knee to be straightened out.

Most of the hamstrings are located in the back of the thigh and allow the knee to bend back.

The quads and the hamstrings are essential for almost every daily physical activity we do, such as:

- walking
- running



- going up and down stairs
- squatting

Artificial Knee

Artificial knees have improved a lot over the years. They are made of 2 parts; the first is anchored in the femur and the second is anchored in the tibia.

Knees work the same way as a hinge joint. Artificial knees allow a very wide range of motion, though slightly less than a normal knee.

Artificial knees depend on the muscles of the legs in order to stay in place. This is why it is very important to strengthen leg muscles in the knee area after a knee replacement. It is best to strengthen ALL of the muscles of the legs.

Leg muscles are usually weak if they have not been used for months or years due to pain. The risk of dislocating a new knee joint is the highest during the first 6-8 weeks after surgery.



Physical Therapy

With time and physical therapy, your new knee will work and feel like a normal knee. However, there might be lots of pain and stiffness in the knee at first.

Your orthopedic surgeon may recommend using a knee immobilizer, crutches, or a walker right after surgery to ease the pain.

While you are still in the hospital after surgery, a continuous passive motion (CPM) machine may be used to bend your knee repetitively to loosen up the new joint.

The surgeon will also let you know how much weight you can put on the operated leg. As your physical therapy progresses, you will be able to put more and more weight on the leg without feeling pain.

It is your responsibility to go to physical therapy, strengthen your leg, and improve the range of motion in your new knee. The surgeon, the nurse, and the physical therapist will guide and help you after your surgery.

Right after surgery, when the knee is still healing, it is important to ask for enough pain medication to overcome surgical pain and start the exercise program.

After a while, pain usually disappears completely and exercising becomes more enjoyable.

As with any physical therapy program, there are a few main guidelines to remember. The following are some tips to help you as you strengthen your new knee joint.

Start slow and progress gradually. Set achievable goals for yourself and discuss them with your physical therapist. Examples of such goals include:

- walking 100 yards
- going up or down the stairs
- straightening the knee fully
- taking short walks around the house or the block



Reward yourself as you achieve goals. If you reach a long-term goal, you could buy yourself a new outfit or rent a good movie!

Ask family and friends for help and motivation. For example, someone could walk with you and keep you company.

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Ask family and friends for help and motivation. For example, someone could walk with you and keep you company.

Stay in shape. Keep doing the exercises, even years after your operation.

However, it is ultimately up to you to strengthen your muscles and improve your range of motion.

Some pain may be expected. Lots of pain is not! Call your surgeon or physical therapist for advice or help at any time.

Exercises

Quadriceps Setting

While lying on your back, keep your legs straight, together, and flat down with your arms by your sides. Tighten the quads, one leg at a time, while pushing the back of your knee down. Hold for 5 seconds, then relax for 5 seconds. Repeat about 10 times

for each leg. You can do several sets of this exercise a few times every hour, if you can manage any pain you have.

Knee Extension Hang

After placing a rolled towel under the ankle, do quadriceps sets. This exercise can be repeated a few times every hour, just like quadriceps setting.

Terminal Knee Extension

While lying down, place a pillow under your knees so that they are bent at a 30- or 40-degree angle. Straighten one leg at a time, hold it straight for about 5 seconds, then relax it slowly back to the initial position. Repeat 10-20 times, as much as you can manage the pain.

Straight Leg Raising

While lying on a bed, bend one leg, pulling the foot toward your body, until the foot is flat on the bed. Raise the other leg while keeping it straight, with the heel about 6 to 10 inches above the bed. Hold for 5 seconds, then relax slowly. Repeat 10-20 times. As you get stronger, you may want to place a sandbag over the raised foot to add resistance and gain more strength.

Knee Flexion

Right after surgery, your knee may feel stiff, especially when you bend it. You should eventually be able to bend your knee 90 degrees. Sit in a chair and tighten the back of the thigh while bringing the heel toward the chair. Hold for 5 seconds, and then relax. Repeat 10-20 times for each leg.

Ankle – Two Exercises

Slowly move each foot separately in a circular motion, first clockwise then counter-clockwise. Repeat 15-20 times.

While lying down, place a towel under the calf so that the heel is raised up. First, point the foot toward the nose and hold it for 5-10 seconds, then point it down and hold again for 5-10 seconds. Repeat 15-20 times

Hip Extension – Gluteal Set

Lie down flat and squeeze your buttock muscles together without holding your breath. Hold together for 5-10 seconds; repeat 15-20 times.

Knee & Hip Flexion

While lying down flat, slide one heel at a time towards your body to a bent-knee position. Hold for 10-15 seconds; repeat 10-20 times.

Knee & Hip Flexion with Assistance

Do a knee and hip flexion exercise while pulling the foot toward the buttock using a rolled sheet. Hold for 10-15 seconds; repeat 10-20 times.

Hip Abduction & Adduction

While lying down with the legs straight and together, slide each leg separately out and then back in, while keeping the knee straight and the toes pointed up. Hold for 10-15 seconds; repeat 10-20 times.

Isometric Hip Abduction

Place a pillow in between the legs and a belt around the thighs just above the knee. Push out against the belt slowly, hold for 5-10 seconds, and relax. Repeat 15-20 times.

Hip Extension – Bridging

While lying down with knees bent and feet flat, lift up the buttock and hold it for 10-15 seconds. Repeat 10-20 times.

Heat and Ice

Heat and ice can be used to aid with the exercises.

Ice helps to decrease swelling and pain. A bag of crushed ice may be used for 10-20 minutes.

A heating pad may also be used to loosen up the muscles and increase the knee's range of motion; it can also be used for 10-20 minutes.

It is important to remember that your knee surgery may cause decreased sensation in the knee; therefore, check the temperature of anything you put on your knee with your hand first. You should also look at the knee often while using heat to make sure you are not burning the skin!



Other Activities

Walking is recommended but does not replace the exercises pointed out in this lesson or by your physical therapist.

You should not drive until you check with the surgeon to make sure it would be safe.

You should also refrain from sexual intercourse until you check with your surgeon.

Patients who plan to undergo dental or surgical procedures should make sure to tell the dentist or surgeon about their knee replacement operation. They may need to be given some antibiotics to prevent the artificial knee from getting infected.

Summary

Knee replacement surgery is a very successful and safe operation. The long-term results of this operation mostly depend on your faithful efforts toward strength and endurance.

It is very important to exercise the leg and the whole body regularly. It is just as important to stay fit and not become overweight.

The greatest majority of patients who have a knee replacement surgery are able to resume most of their activities and live active and painless lives.